AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Previously Presented) A system for a transmitter comprising:

a plurality of antennas to define a respective plurality of fixed beams which together cover a coverage area;

for each antenna, a respective signal generator to generate a respective signal comprising a common overhead component common to all the signals, using a spreading code common to all the signal generators;

transceiver circuitry coupling the signal generators to the antennas such that a respective one of the signals is transmitted by each corresponding antenna, the signals to be transmitted substantially simultaneously;

for each pair of said antennas having overlapping beams within said coverage area, the respective pair of signal generators to use the spreading code with a mutual micro-timing offset that is large enough that destructive cancellation substantially does not occur between the common overhead components transmitted on the overlapping beams, wherein a first spreading code used to generate a signal by a first of the pair of signal generators is offset by the mutual micro-timing from a second spreading code used to generate a signal by a second of the pair of signal generators.

2. (Previously Presented) A system according to claim 1, implemented for a plurality of coverage areas, each coverage area being a respective sector served by a base station, wherein the plurality of fixed beams together cover a corresponding one of the sectors, and wherein the sectors are associated with respective different spreading codes.

3. (Original) A system according to claim 1 wherein the transmitter is a CDMA base station, and each signal is a CDMA signal.

4. (Original) A system according to claim 2 wherein the transmitter is a CDMA base station, and each signal is a CDMA signal.

5. (Previously Presented) A system according to claim 1, wherein the coverage area is a cell sector, wherein the respective mutual micro-timing offset is less than a predefined maximum value such that the mutual micro-timing offset does not cause a source of one of the signals to be incorrectly identified as located in another cell sector.

6. (Previously Presented) A system according to claim 5 wherein:

the sector has a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of signals is realized by applying the sector-specific spreading code with a respective mutual micro-timing offset.

7. (Original) A system according to claim 6 wherein the sector-specific spreading code is a PN code.

8. (Previously Presented) A system according to claim 7 wherein each mutual micro-timing offset is at least one chip and less than eight chips.

9. (Currently Amended) ~~A system according to claim 7~~A system for a transmitter comprising:

a plurality of antennas to define a respective plurality of fixed beams which together cover a coverage area;

for each antenna, a respective signal generator to generate a respective signal comprising a common overhead component common to all the signals, using a spreading code common to all the signal generators;

transceiver circuitry coupling the signal generators to the antennas such that a respective one of the signals is transmitted by each corresponding antenna, the signals to be transmitted substantially simultaneously;

for each pair of said antennas having overlapping beams within said coverage area, the respective pair of signal generators to use the spreading code with a mutual micro-timing offset that is large enough that destructive cancellation substantially does not occur between the common overhead components transmitted on the overlapping beams, wherein a first spreading code used to generate a signal by a first of the pair of signal generators is offset by the mutual micro-timing from a second spreading code used to generate a signal by a second of the pair of signal generators;

wherein the coverage area is a cell sector, wherein the respective mutual micro-timing offset is less than a predefined maximum value such that the mutual micro-timing offset does not cause a source of one of the signals to be incorrectly identified as located in another cell sector,

wherein the sector has a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of signals is realized by applying the sector-specific spreading code with a respective mutual micro-timing offset,

wherein the sector-specific spreading code is a PN code;

wherein each mutual micro-timing offset is less than half a width of a traffic search window implemented in a mobile terminal communicating with the transmitter.

10. (Previously Presented) A system according to claim 6 wherein the sector-specific spreading code is a short code having a sector specific offset used to distinguish between other sources using the same short code, and wherein the respective mutual micro-timing offset is small enough that substantially no ambiguity between different sector specific offsets occurs at a receiver in respect of any pair of signals transmitted by adjacent antennas.

11. (Original) A system according to claim 10 wherein the short code is of length 2^15-1.

12. (Original) A system according to claim 4 wherein: the sector has a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of CDMA signals is realized by applying the sector-specific spreading code and then applying a mutual micro-timing offset.

13. (Original) A system according to claim 4 wherein:

the sector has a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of CDMA signals is realized by applying the micro-timing offset to respective sector-specific spreading code generators.

14. (Original) A system according to claim 12 wherein the sector-specific spreading code is a PN code.

15. (Previously Presented) A system according to claim 1 wherein the common overhead component comprises at least one of pilot channel, sync channel, paging channel, quick paging, advanced access channel and auxiliary pilot.

16. (Original) A system according to claim 4 further comprising:

for each active user located within the sector, at a given instant only one of the CDMA signals includes a user-specific traffic component generated by the respective CDMA signal generator.

17. (Previously Presented) A system according to claim 16 wherein the one of the CDMA signals to include the user-specific traffic component for a given user is identified by analyzing signal strength on reverse links from the user, and selecting the CDMA signal corresponding with the reverse link having a best signal strength.

18. (Original) A system according to claim 1 wherein the transceiver circuitry is further adapted to provide transmit frequencies in a manner such that the transmit frequencies include a frequency offset from one another.

19. (Previously Presented) A system according to claim 18 comprising a beam-forming matrix connected to the plurality of antennas.

20. (Original) A system according to claim 19 wherein the beam-forming matrix is a Butler matrix.

21. (Previously Presented) A system according to claim 18 wherein the frequency offset is chosen to further reduce undesirable effects of signal cancellation.

22. (Original) A system according to claim 18 wherein the signals have unique traffic channels.

23. (Previously Presented) A system according to claim 22 wherein the frequency offset is a multiple other than that of a frame rate.

24. (Original) A system according to claim 18 wherein the frequency offset is greater than 30 Hz and less than 120 Hz.

25. (Previously Presented) A system according to claim 1 further comprising:

means in the transceiver circuitry for providing transmit phases that include a time dependent phase offset from one another, wherein the phase offset is chosen to reduce undesirable effects of signal cancellation.

26. (Previously Presented) A method in an antenna system comprising:

transmitting, from antennas of the antenna system, signals each having a common overhead component on a plurality of beams within a sector, with a micro-timing offset of a spreading code used by the signals transmitted on adjacent overlapping beams, wherein the micro-timing offset is large enough that destructive cancellation substantially does not occur between common overhead components on the adjacent overlapping beams, wherein a first spreading code used to generate a signal on a first of the overlapping beams is offset by the micro-timing offset from a second spreading code used to generate a signal on a second of the overlapping beams,

wherein the plurality of beams are transmitted in the sector that is from among plural sectors of a cell.

27. (Previously Presented) A method according to claim 26 wherein the sector has a sector-specific spreading code, and wherein the respective micro-timing offset between each pair of signals is realized by applying the sector-specific spreading code with a respective mutual micro-timing offset.

28. (Previously Presented) A system according to claim 1, wherein the plurality of fixed beams defined by the corresponding plurality of antennas together cover a sector from among plural sectors of a cell.

29. (Previously Presented) A method according to claim 26, wherein the micro-timing offset is less than a predefined maximum value such that the micro-timing offset does not cause a source of one of the signals to be incorrectly identified as located in another sector.

30. (Previously Presented) A system according to claim 1, wherein the first spreading code is the spreading code common to all the signal generators, and the second spreading code is offset from the first spreading code by the mutual micro-timing offset.

31. (Previously Presented) A method according to claim 26, wherein the first spreading code is the spreading code of the sector, and the second spreading code is offset from the first spreading code by the micro-timing offset.